

U.S. Patent Application No. 09/996,516
Amendment dated October 24, 2005
Reply to Office Action dated October 11, 2005

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-13 (Canceled)

Claim 14 (Previously presented): A method of improving sizing in a paper or paperboard product, comprising:

combining a papermaking sludge with an enzyme composition to form an enzyme-treated sludge;

combining said enzyme-treated sludge with a papermaking pulp to form a treated pulp;
and

forming a paper or paperboard product from said treated pulp, wherein said product has improved sizing compared to the sizing of an identical paper or paperboard product but not having the sludge treated with enzyme composition,

wherein said enzyme composition comprises at least one polyamide oligomer and at least one cellulolytic enzyme.

Claim 15 (Canceled)

Claim 16 (Previously presented): The method of claim 18, wherein said enzyme-treated sludge is added in an amount of from about 1 pound per ton of papermaking pulp to about 50 pounds per ton of papermaking pulp based on the dried solids weight of both the enzyme-treated

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sludge and the papermaking pulp.

Claim 17 (Canceled)

Claim 18 (Previously presented): A method of improving sizing in a paper or paperboard product, comprising:

combining a papermaking sludge with an enzyme composition to form an enzyme-treated sludge, wherein said enzyme composition comprises at least one of a protease, an esterase or a lipase;

combining said enzyme-treated sludge with a papermaking pulp to form a treated pulp;
and

forming a paper or paperboard product from said treated pulp, wherein said product has improved sizing compared to the sizing of an identical paper or paperboard product but not having the sludge treated with enzyme composition.

Claim 19 (Original): The method of claim 18, wherein said papermaking pulp comprises a sizing material.

Claim 20 (Original): The method of claim 18, wherein said papermaking pulp comprises an ASA sizing emulsion.

Claim 21 (Original): The method of claim 18, wherein said improved sizing comprises an improved retention of sizing material.

Claim 22 (Original): The method of claim 18, wherein said improved sizing comprises an improved resistance to size reversion.

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Claim 23 (Original): The method of claim 18, wherein said enzyme composition has cellulytic activity.

Claim 24 (Original): The method of claim 18, wherein said enzyme composition has both cellulytic and hemicellulytic activity.

Claim 25 (Original): The method of claim 18, wherein said enzyme composition has lipase activity.

Claim 26 (Original): The method of claim 18, wherein said enzyme composition is added to said papermaking sludge in an amount of from about 1.00% by weight to about 0.001% by weight active enzyme based on the dried solids weight of both the active enzyme and the sludge.

Claim 27 (Original): The method of claim 26, wherein said enzyme composition comprises from about 5% by weight to about 20% by weight active enzyme based on the dried solids weight of both the active enzyme and the enzyme composition.

Claims 28 and 29 (Canceled)

Claim 30 (New): The method of claim 18, wherein said enzyme composition comprises said protease.

Claim 31 (New): The method of claim 18, wherein said enzyme composition comprises said esterase.

Claim 32 (New): The method of claim 18, wherein said enzyme composition comprises said lipase.